Claims

1. A piezoelectric biochip for the detection of the bovine spongiform encephalopathy (BSE) pathogen, which piezoelectric biochip comprises a piezoelectric chip (1), a common electrode (2) which is fixed on the lower side surface of the piezoelectric chip, and a microelectrode array (3) which is fixed on the upper side surface of the piezoelectric chip, characterized in that a plurality of BSE prion protein (PrP) antibodies are immobilized on the electrodes of the microelectrode array in a format corresponding uniquely to the electrodes of the microelectrode array, thereby forming a BSE PrP antibody array (4).

2. The piezoelectric biochip for the detection of the BSE pathogen according to claim 1, characterized in that in the BSE PrP antibody array (4), PrP antibodies of 1-1000 nm thick are immobilized on the electrodes of the microelectrode array, and that the antibody array comprises antibodies against PrPs with various N-terminal amino acid sequences and in normal and/or abnormal configurations.

3. The piezoelectric biochip for the detection of the BSE pathogen according to claim 2, characterized in that the BSE PrP antibody array consists of antibodies against normal and abnormal PrPs with N-terminal amino acid sequences identified in I and II, respectively, and that the thickness of the PrP antibody is 100-150 nm.

4. A piezoelectric biochip for the detection of the BSE pathogen

according to claim 2, characterized in that the BSE PrP antibody array consists of six antibodies against normal and abnormal PrPs with N-terminal amino acid sequences identified in I, II, and III, respectively, and that the thickness of the antibody is 100-150nm.

5. A piezoelectric biochip for the detection of the BSE pathogen according to claim 2, characterized in that the BSE PrP antibody array consists of eight antibodies against normal and abnormal PrPs with N-terminal amino acid sequences identified in I, II, III, and IV, respectively, and that the thickness of the antibody is 100-500nm.

6. A method for manufacturing a piezoelectric biochip for the detection of the BSE pathogen, which method comprises:

(1) manufacturing a microelectrode array; and

(2) immobilizing PrP antibodies on the electrodes of the microelectrode array (3) by physical adsorbing, chemical bonding, cross-linking, embedding or self-assembly process, wherein the environmental temperature for antibody immobilization is greater than 0℃ to 70℃ inclusive, and the immobilization period of time is 0.1-24 hours, such that the configuration of the PrP antibodies remains unchanged before and after immobilization.

7. The method for manufacturing a piezoelectric biochip for the detection of the BSE pathogen according to claim 6, characterized in that the antibodies are immobilized on the electrodes of the microelectrode array by a cross-linking process with a fixing agent

consisting of 4% paraformaldehyde, 25% glutaraldehyde, 10% phosphate buffer solution at pH 6-8, and a balance of water, wherein the immobilization temperature is 4℃ and the immobilization period of time is 8 hours.

8. The method for manufacturing a piezoelectric biochip for the detection of the BSE pathogen according to claim 6, characterized in that the antibodies are immobilized on the electrodes of the microelectrode array by a cross-linking process with a fixing agent consisting of 2% ethyl-dimethylaminopropyl carboimide hydrochloride, 25% glutaraldehyde, 10% phosphate buffer solution at pH 6-8, and a balance of water, wherein the immobilization temperature is 15℃ and the immobilization period of time is 4 hours.

9. The method for manufacturing a piezoelectric biochip for the detection of the BSE pathogen according to claim 6, characterized in that the antibodies are immobilized on the electrodes of the microelectrode array by self-assembly of biotin and avidin, wherein the immobilization temperature is 25℃ and the immobilization time is 8 hours.